

Science Curriculum Overview KS3

All students in Y7 and Y8 follow the KS3 Science curriculum linked to the KS3 National Curriculum. Each student studies six hours of Science per fortnight. KS3 is taught by all members of the Science Department. There are 14 members of Science teaching staff supported by three technicians and a Science T.A. The Head of Department has oversight of the key stage and is supported by the Heads of Subject (Biology, Chemistry and Physics).

Intent at KS3 (what do you want to achieve?)

Our intent is that students receive a broad and balanced curriculum across KS3. Covering all three subject areas of Biology, Chemistry and Physics, whilst also developing the Scientific skills to enable their progression and application of the theoretical concepts. We want pupils to be actively engaged, enthused and inspired by their experiences in and out of the classroom.

We want all pupils to make progression throughout the key stage and all pupils are taught in mixed ability classes covering all the same material. Pupils are summatively assessed at the end of each topic (six in Y7, six in Y8). There is a formative assessment embedded in each of the topics in each year group, with a further significant piece of work for assessment in each topic, plus appropriate home works.

Differentiation/ support/ challenge are built in to the Schemes of work, which are used by all staff to ensure a level of consistency in delivery of all content to all pupils regardless of level of disadvantage or minority groupings.

KS3 builds on the basics learned at KS2 and the curriculum is designed in a spiral, where pupils will develop deeper and more complexing understanding from KS2, through KS3 and on into KS4 and KS5 beyond that. Whenever there is an opportunity to reflect and support the CHRIST values, teachers and pupils are encouraged to do so fully. E.g. The department has a policy document outlining how teachers can support the teaching of cells and reproduction whilst fully supporting the Catholic values of the school and Fundamental British Values. We encourage Students to be able to apply study skills in terms of independent learning, metacognitive strategies and preparation for assessment.

At KS3 we run a Y7 Science club and a KS3 Space Academy, a Y7 visit to The Yorkshire Wildlife Park, and encourage pupils to explore the subjects beyond the curriculum.

Cultural capital is the knowledge that pupils will need to succeed in life. In Biology pupils will further learn about cells and reproduction, how they develop themselves through puberty and adolescence, we explore some of the moral aspects around reproduction (the department has policy document (Appendix 3) to ensure that this taught in a way that educates the pupils whilst supports the Catholic teachings). Pupils also explore how species are classified and how variation within and between species comes about, how diseases spread, the use of vaccines and antibiotics. In Chemistry pupils explore the particle model of substances, changes of state, dissolving and separation techniques, which household substances are acids and alkalis, how to neutralise stings, look at chemical reactions and the causes of weathering and how it affects the world around them and leads on to knowledge of the rock cycle and the structure of the Earth. They look closely at the atmosphere, our

impacts and how we can reduce our impact on the environment around us. In Physics pupils explore what Forces are and what they can do, what speed is and how to measure it, why things float, and why others do not, pupils then explore Space and gain an understanding of the Solar system and why we experience eclipses. Pupils learn the difference between heat and temperature, how energy is transferred, what insulation is and its impact on preserving energy resources and saving money. They learn about electricity and magnetism and light and sound. They also explore the different alternative energy resources and why they are needed.

Implementation at KS3

Units are taught as cross linked topics in Biology, Chemistry and Physics. Each topic is referenced to the KS2 statutory requirements, though care is taken not to assume that all pupils have been exposed to this at KS2 equally, through re-cap and assessing prior knowledge retention.

Our programmes of study are designed to encompass a spiral curriculum, from KS2 through years 7 & 8 and onto GCSE in years 9,10 & 11. The key features and links are contained in Appendix 1.

Setting in Y7 is by form and in balanced, mixed ability sets in Y8 based upon performance across Y7 and in the Y7 End of Year test. We review to ensure gender balance and other key groups such as PP, EAL and SEND, unless TA support means that this needs to be taken in to account. We aim to ensure that all pupils receive the same, broad and balanced delivery of the curriculum by rotating all staff through KS3 classes, to ensure that they are up to date with the curriculum and links to KS4. A Quality Assurance programme within the department is used to ensure that the teaching and learning is at least of the expected standard. On recruitment and in the event of the any long term staff absence, the Department ensures, where possible, that suitable subject specialists are employed to ensure that KS3 is delivered fully and effectively.

Science Club is run within department for Year 7 students. Space Academy has launched this year and is open to all with an interest in any application of STEM in this subject. Y7 visit the Yorkshire Wildlife park with a suitable educational focus on conservation and breeding programmes. Y8 High Starters attend an 'Engineering Extravaganza' hosted at the University of York.

Pupils are encouraged to explore all topics beyond the curriculum, which is further enhanced by certain formative assessments opportunities requiring research and or/ construction to explore aspects of a topic – e.g. construct and label a cell with its functions.

Where differentiation is required for pupils, staff are encouraged to save such resources in to the lesson folder on the scheme of learning. In addition, the Department has produced some specific resources for Specific EAL groups. We have extended these to form a number of key resources for SEND. However, our core aim remains to ensure that all pupils are exposed to the full curriculum at KS3 to provide strong a strong foundation for the topics at KS4 and beyond to learners of all backgrounds, abilities and starting points.

As part of the CPD cycle Heads of Subject will be meeting to discuss how English and Maths is, and should be taught in Science, and how Science is and should be taught in other subject, such as PE, Geography, History and Food Technology, to allow familiarity out of

context and to contribute to their curriculum goals and to embed shared key concepts in their long term memories. The literacy and numeracy demands increase across KS3 and help to prepare those that pupils will meet at KS4 and beyond. Teachers have expert knowledge of the subjects that they teach. If they do not, they are supported to address gaps in their knowledge, through Lead Practitioners and Subject Specialists and Leaders, so that pupils are not disadvantaged by ineffective teaching.

The Schemes of Learning are designed to offer pupils the best experience of Science, to ensure engagement and enthusiasm by linking the topics covered to pupils' own experiences and contexts, and encourages them to explore these over and above that covered in the curriculum. On interview and ITT placement staff members are encouraged to reflect on what makes a 'KS3 lesson successful?', and we are looking to enhance the passion for the subject that the teachers have, to reflect on this when planning lessons, and having taught the lessons to ensure that this comes across for the pupils.

All Schemes of Learning contain revision lessons, a standardised test, and review which allows consolidation of that topic before moving on to the next. Pupils review what revision they have done, how they have revised and the impact of this revision upon their understanding and knowledge. DIRT tasks then allow pupils to consolidate before moving on to the next topic. The end of year test includes the core content from each of these topics across the year, pupils are issued with a revision list and resources, and then these tests are reviewed as above before pupils move on to the content of the following year. (See Appendix 1).

A key part of our plan for education is to ensure children become valuable and fully rounded members of society who treat others with respect and tolerance, regardless of background.

The Science Curriculum we promote the basic British values of democracy, the rule of law, individual liberty, and mutual respect and tolerance for those of different faiths and beliefs, whilst fundamentally supporting the Catholic ethos and CHRIST values of the school.

We ensure that young people understand the importance of respect and leave school fully prepared for life in modern Britain. We promote an understanding of how citizens can influence decision-making through the democratic process, and Scientists use peer review in Scientific Research.

Whilst fundamentally supporting the Catholic ethos and CHRIST values of the school we ensure that we provide pupils with an understanding that the freedom to hold other faiths and beliefs is protected in law, and that acceptance that people having different faiths or beliefs to oneself (or having none) should be accepted and tolerated, and should not be the cause of prejudicial or discriminatory behaviour.

Topics such as the Biology 'Cells and Reproduction' give the opportunity to provide an understanding of the importance of identifying and combating discrimination, whenever issues arise in class staff challenge this, sanction and report to DSLs and/or CWO for further action such as PREVENT or CHANNEL, challenging the ideology that supports terrorism and those who promote it and protecting vulnerable people.

The Science KS3 curriculum is designed to enable good learning habits and skills such as metacognition. Teachers enable pupils to understand key concepts, presenting information clearly and encourage appropriate discussion. Teachers check pupils understanding effectively, and identify and correct misunderstandings. Teachers ensure that pupils embed

key concepts in their long term memory through lesson and curriculum design, together with assessment, review and DIRT. This further encourages pupils to transfer key knowledge to long term memory, it is sequenced so that new knowledge and skills build on what has been taught before and pupils are working towards clearly defined end points, by topic, year and key stage. Teachers use assessment to check pupils' understanding in order to inform teaching, and to help pupils embed and use knowledge fluently, and develop their understanding of the 2014 National Curriculum Science.

Impact at KS3

Teachers use assessment to check pupils' understanding in order to inform teaching, and to help pupils embed and use knowledge fluently, and develop their understanding.

Pupils are tracked across the key stage. There are six end of topic tests in each of Y7 and Y8, and an end of year test at the end of each year. This allows the department to assess as to how well pupils are learning the content and skills in the curriculum at 14 points across two years, and to track, monitor and review key groups to ensure that their progress matches expectation and of all pupils. (Appendix 2)

Appendix 1 reflects how the content, understanding, knowledge and skills helps prepare all pupils for the next stage. All pupils are prepared at KS3 as if they were to undertake Trilogy at KS4 so that all pupils have exposure to topics that they may otherwise miss.

Pupil voice shows that pupils are motivated and engaged in Science, the Department reflects on pedagogy, content and style where pupil voice suggests that an aspect is less engaging or relevant to them. Our reflective teachers feel able to adjust and personalise their teaching practice, to enthuse their classes, provide cultural capital and offer extended curriculum opportunities. Staff are encouraged to share good practice, successful resources and to visit colleagues in order to develop their own teaching.

Analysis of class and year group performance in assessments allow the department to review the teaching and learning in, and between each topic to allow planning and adaptation where found to be required.

Pupils are always encouraged to ask and answer questions around all aspects of the curriculum, as we want pupils to be actively engaged, enthused and inspired by their experiences in and out of the classroom, to take with them in to KS4 and KS5 and provide the Scientific stepping stones to help them succeed in life.

Appendix 2

Science Department KS3 Assessment Schedule

In line with the school policy, the department seeks to achieve a balance, so that marking is effective and useful for both students and teachers.

For each student, a minimum of **one formative piece** and **one summative piece** must be marked per topic which will work out as one of each **per half term** for groups that are not split.

Formative Assessments

There needs to be one formative assessment per topic, there are suggested suitable tasks on the attached schedule to assist planning.

Each formative piece must be marked using the school stickers and the students must act to improve this in designated DIRT time.

In addition, there is a **verbal feedback** stamp for the student to record verbal feedback.

For each KS3 summative test there are alternatives for each question, once pupils have completed a test review sheet, or they can create a revision resource to improve their target areas.

At KS4 the use of past examination questions and mark schemes is recommended for formative assessments.

Whilst pupils and teachers are undertaking any form of assessment including DIRT this should also include improvements to areas/issues of literacy, suggest that you focus on three literacy errors, maximum, per piece of work.

Summative Assessments

Pupils undertake a summative test at the end of each unit.

This mark and grade, needs to be recorded on the appropriate tracking sheet.

When marked work is returned to students, it is important that they have DIRT time, which is most easily achieved through the use of the review sheets as stated above, where they are able to reflect on the strengths/areas for development in their assessed work.

Teachers should set aside appropriate review formally assessed work with students.

For end of year tests, or mock examinations the use of the question analysis spread sheet will help inform you where whole class DIRT is required.

KS3 Assessment Schedule:

Year 7

Term 1.1 (September – October HT)

Formative – Pride Piece ‘Laboratory Safety’ - (to also prevent literacy dip)

Further Formative assessment – Ice cube melting in terms of particles

Summative – C7.1 Chemistry

Term 1.2 (October HT – Christmas)

Formative – Cell Biology- design a cell, two options draw or model

Summative – B7.1 Cells and Reproduction or P7.1 Forces

Term 2.1 (January – February HT)

Formative – Cell Biology or Boat Challenge Review

Summative – B7.1 Cells and Reproduction or P7.1 Forces

Term 2.2 (February HT – Easter)

Formative – Thermos Flask design or Robbie the Rock - rock cycle story

Summative – P7.2 Heating and Cooling or C7.2 Acids Alkalis and Rocks

Term 3.1 (Easter – May HT)

Formative – Thermos Flask design or Robbie the Rock - rock cycle story

Summative – P7.2 Heating and Cooling or C7.2 Acids Alkalis and Rocks

Term 3.2 (May HT – July)

Formative – Simpson’s family tree activity assessing knowledge of inheritance and variation

Summative – B7.2 Class and Variation and Year 7 end of year test

KS3 Assessment Schedule:

Year 8

Term 1.1 (September – October HT)

Formative – ECM and combustion double sided worksheet

Summative – C8.1 ECM and atmosphere

Term 1.2 (October HT – Christmas)

Formative – Biology: two options, label and fill in blanks worksheet, OR the journey of food writing task. Physics refraction and reflection activity

Summative – B8.1 digestion and respiration or P8.1 light and sound

Term 2.1 (January – February HT)

Formative – Biology: two options, label and fill in blanks worksheet, OR the journey of food writing task. Physics refraction and reflection activity

Summative – B8.1 digestion and respiration or P8.1 light and sound

Term 2.2 (February HT – Easter)

Formative – electric circuits diagrams OR reactions of metals and acids equations sheet

Summative – P8.2 electric circuits and magnetism C8.2 Chemical reactions

Term 3.1 (Easter – May HT)

Formative – electric circuits diagrams OR reactions of metals and acids equations sheet

Summative – P8.2 electric circuits and magnetism C8.2 Chemical reactions

Term 3.2 (May HT – July)

Formative – Top trumps: pupils to design four top trumps cards for diseases

Summative – B8.2 causes of disease and end of year 8 test

Appendix 3

Teaching Reproduction

Here at St John Fisher Catholic High School we have the privilege to teach engaged, intelligent and inquisitive pupils. As part of the topic of Cells and Reproduction, it is natural, and to be encouraged, that you may well be asked some challenging questions. Some will be easily dealt with as issues of 'plumbing' whilst others may lead you in to areas of discomfort or challenge.

However, it is important to remember that we are teaching in a Catholic School and support the Catholic Ethos. In order to help support staff, in this topic in particular, we have produced the following document for information.

If you feel unsure as to how/ what to answer, do encourage pupils to talk to their parent/carers and/or seek advice from the Head of Department and other colleagues. If in doubt you can always preface an appropriate comment with 'as Catholics we believe.....'.

The starting point for a Christian understanding of human sexuality is the belief that all humans are made 'in the image of God'.

God created man in His own image, in the image of God created He him; male and female created He them.'

Genesis 1:27

The creation story in Genesis shows how male and females are intimately connected to each other:

So the Lord God caused a deep sleep to fall upon the man, and while he slept took one of his ribs and closed up its place with flesh; and the rib which the Lord God had taken from the man He made into a woman and brought her to the man. Then the man said, "This at last is bone of my bones and flesh of my flesh; she shall be called Woman, because she was taken out of Man." Therefore a man leaves his father and his mother and cleaves to his wife, and they become one flesh.

Genesis 2:21-24

This story suggests that man and woman unite to become complete.

St Paul reminds Christians that: "Do you not know that your body is a temple of the Holy Spirit within you, which you have from God? You are not your own; you were bought with a price. So glorify God in your body." 1 Corinthians 6:19-20

This teaching is important because it refers to the responsibility Christians have for what they do with their body and how they treat it. The teaching has a strong implication for a Christian's sexuality.

The Roman Catholic belief is that when a man and woman connect to each other in a sexual way, it is the most intimate physical expression of their total union. For this reason, the Roman Catholic Church teaches in Familiaris consortio that this union is sacred and is a key element in marriage.

Most Christians accept the teaching that sexual relationships should only happen in marriage. This is supported by one of the Ten Commandments in Exodus:

You shall not commit adultery.

Exodus 20:14

Christians believe that this commandment shows that God wants people to exercise sexual fidelity within marriage and chastity before marriage.

Chastity

Chastity is generally understood as the act of saving yourself sexually for a particular time or person. For many Christians, this means not having a sexual relationships outside marriage. While many Christians recognise that people often do enter into a sexual relationship before they get married, most believe that this is not an ideal situation.

The American Baptist Churches sponsor a movement called 'True Love Waits' which supports young people who want to remain virgins until they marry.

Contraception

Contraception is an umbrella term that includes any way to prevent a pregnancy as a result of sexual intercourse. There are different beliefs about how contraception should be used, depending on what denomination or church a Christian belongs to.

The Roman Catholic Church teaches that the act of sex is a way of showing true love and it is through this expression of love that God works to create new life. Since one of the purposes of sex is to procreate, the use of artificial methods of contraception interferes with God's creative act and is not acceptable.

Most **Protestant Christian** groups believe that sex is an important way to show love and affection in a marriage but it is not exclusively for procreation. Therefore many allow the use of artificial contraception as it allows a couple to show their love for each other and to regulate the size of their family.

The **Quaker** stance on sexual relationships is:

Sexual activity is essentially neither good nor evil; it is a normal biological activity which, like most other human activities, can be indulged in destructively or creatively.

Towards a Quaker view of sex, 1963

Quakers are happy for each couple to decide for themselves on whether or not they wish to use contraception.

The Methodist Church holds the view that contraception can be a way to enable a couple to reach fulfilment in their marriage for the good of the family.

What it means to be human

Religious ideas about humanity usually include the belief that God created all human beings. Many religious people see a human being as a combination of a body and a soul. All religions value human life and believe that it always deserves respect.

Sexuality

Human beings are a combination of different characteristics. These include:

the physical, or bodily

the spiritual, or what goes beyond the body to give a deeper sense of existence

the emotional, which guides the way a person responds to situations, eg anger, hatred

the mental, which is how a person's mind works and responds

the sexual, which deals with sexual instincts, physical attraction and sexual interactions with others.

All of these aspects are fundamental to someone's personality. Each person has a different type of combination, but everyone has some element of each aspect. Sexuality is as important to the individual as any other of these features and it never leaves the individual.

Heterosexuality

'Hetero-' is a Greek prefix meaning 'different'.

Heterosexual is the word to describe people who are sexually attracted to people of the opposite gender.

Homosexuality

'Homo-' is a Greek prefix meaning 'same'.

Homosexual is the word used to refer to people who are sexually attracted to people of the same gender. Men who are attracted to each other are often referred to as gay men and females who are attracted to each other as lesbians.

Heterosexuality

The legal age of sexual consent for heterosexuals in the UK is 16. Consent means agreeing to something, in this case to having sexual intercourse.

Statutory rape is when one or both of the parties engaging in sexual activity are below the age of consent. Statutes are laws. This law means that a 14-year-old girl cannot legally consent to have sex with her 16-year-old boyfriend. This act would be considered unlawful.

Homosexuality

Homosexuality used to be illegal in the UK. The Sexual Offences Act 1967 made changes so that homosexual men over age 21 could have sexual relationships, in private.

In 1994 a further change saw it reduced to those aged over 18.

The Sexual Offences (Amendment) Act 2000 made the ages of legal consent for heterosexuals and homosexuals equal and the legal age of consent for homosexual people was changed to 16. This change came to effect in Northern Ireland when the Sexual Offences Order was passed in 2008.

What does Christianity say about homosexuality?

Most Church statements that deal with homosexuality only refer to male homosexuality but the same principles can apply to lesbians.

There are great divisions within the Christian community on this issue, with the Roman Catholic Church and some sections of the evangelical churches holding very similar views.

The main arguments for and against homosexuality

Arguments against homosexuality

God made male and female according to the Book of Genesis to complete each other and to procreate. Even if the couple are unable to have children, the sexual union is theoretically open to the production of children.

The natural order represented in nature is for male and female to unite. This is often linked to the natural law argument.

Homosexual practice is forbidden in the book of Leviticus: "If a man lies with a male as with a woman, both of them have committed an abomination; they shall surely be put to death." (Leviticus 20:13).

In some of St Paul's letters included in the Bible, he condemns homosexuality as 'unrighteous' and claims that men who practise homosexuality will not inherit the kingdom of God.

Arguments in favour of homosexuality

Simply because a sexual union cannot result in children, it is not right to forbid any action that is a physical expression of genuine love.

Homosexuals are simply following their natural instincts. This is how God created them, so they should not be condemned.

There is evidence of homosexual activity throughout the animal kingdom.

There are many laws in the Bible that would not be accepted now because the nature of society has changed, eg capital punishment and slavery. We should not be restricted by ancient standards.

Some people believe that St Paul's comments were about male prostitutes, not homosexuality in general.

What does this mean in practice?

Most Christian churches hold the position that you should 'Love the sinner, but hate the sin'. This is generally interpreted to mean that Christians should show love and compassion to homosexuals, but that homosexuals should not engage in sexual activity. This is because most churches teach that sex should only happen within marriage, which the Church defines as being between a man and a woman.

The Roman Catholic Church states:

This inclination, which is objectively disordered, constitutes for most of them a trial. They must be accepted with respect, compassion and sensitivity. Every sign of unjust discrimination in their regard should be avoided...Homosexual people are called to chastity.

Catechism of the Catholic Church 1992, paras 2358-9

The Quaker view on homosexuality is accepting:

Where there is a genuine tenderness, an openness to responsibility, and the seed of commitment, God is surely not shut out. Can we not say that God can enter any relationship in which there is a measure of selfless love? ...To reject people on the grounds of their sexual behaviour is a denial of God's creation.

Towards a Quaker View of Sex, 1963

Most Christians will take a position somewhere between these two views. Some churches offer support to homosexuals in leading a chaste life, while others readily accept openly homosexual people in positions of authority. However, few Christian groups will give a definitive statement on the issue as it would cause divisions within the community.

What are the alternatives to sexual activity?

Virginity

A virgin is somebody who has not had sex. Once a person has had sex, he or she is no longer a virgin.

The term born-again virgin is used by some to describe a person who is no longer a virgin but is now seeking a new start. Some newly religious people see it as a label for a spiritual renewal and a commitment to only have sex within marriage in future.

Some women feel so pressured by the value placed on virginity, that they are driven to have hymen reconstruction surgery.

Chastity

Chastity is generally understood as the act of saving yourself sexually for a particular time or person. Some people take a vow of chastity because they believe that it keeps them sexually pure. The vow may be taken for religious reasons.

Celibacy

Celibacy is generally understood as abstaining from sexual activity. Most people practise celibacy for religious reasons.

Reproductive Technologies and the Vatican

Martin L. Cook

Even casual readers of newspapers and viewers of television news programs have been exposed to the issues raised by the use of new technologies to affect and control human reproduction. From the protracted legal battle that surrogate mother, Mary Beth Whitehead-Gould, waged to win custody of Baby M, to the bizarre cases of inheritance rights of frozen embryos in Australia, there is a growing awareness that it is now possible to manipulate human reproduction in ways that challenge our moral and legal assumptions.

On March 10, 1987, the Vatican responded to these recent developments in reproductive technologies by issuing a 40-page document called "Instruction on Respect for Human Life in Its Origin and on the Dignity of Procreation." This "instruction" was not only aimed at influencing the decisions of Roman Catholics, but also was intended to influence national legislation worldwide on biomedical issues.

What did the document say? It opposed all technological interventions into the process of human reproduction. More specifically, the document condemned artificial insemination and embryo transfer, in vitro fertilization, and surrogate motherhood under all circumstances. It also opposed experimentation on embryos when such experiments were not of direct therapeutic benefit to the fetus, and amniocentesis (a

procedure used to detect fetal defects) when done for the purpose of deciding whether or not to abort the fetus.

The moral basis for these pronouncements is a familiar one in Roman Catholic moral teaching. Official Roman Catholic teaching maintains that human life begins at the moment of conception. From this claim follow the following moral judgments: a fetus or an embryo must be respected and treated as a human person with dignity and rights, including the right to life. Amniocentesis for the purpose of genetic screening is obviously morally objectionable because abortion is wrong. **Similarly, the experimental use of embryos is condemned because it violates human dignity, reducing embryos to objects and instruments of scientific knowledge.**

The moral argument underlying the Vatican condemnation of other practices is not so obvious. Why, for example, does the Church object to the artificial insemination of a childless woman with her husband's sperm? **Such practices are opposed on the grounds that the sexual act has two purposes Ñ the unitive (emotional or spiritual) and the procreative (biological). Since these functions "by nature" belong together, it is always wrong to separate them.** Artificial insemination, in vitro fertilization, and surrogate motherhood are immoral because they involve sexual acts that are **procreative, but not unitive.** And, rightful conception must respect the inseparability of the two meanings of the sexual act. In response to the suffering of infertile couples who want to have children, the document says that couples do not have a right to a child, claiming that such a right would make the child an "object of ownership." Childless couples that avail themselves of these reproductive techniques are said to violate a more important right of the child, the "right to be conceived, carried in the womb, brought into the world, and brought up within marriage."

The reception of the "Instruction" has been (perhaps predictably) mixed. Anyone familiar with the issues recognizes the gravity of the moral concerns raised by the new reproductive technologies. Many are grateful for the Vatican's raising them in such a public way and hope that a more informed and broad public debate will result. On the other hand, many distinguished ethicists and moral theologians have raised significant objections to some of the moral judgments made. Rev. Richard McCormick, S.J., perhaps the most distinguished Catholic moral theologian in the U.S., objects to both the process by which the document was written and to some of its specific judgements. He notes that Church officials failed to consult any major medical ethics experts outside of the Vatican, and questions whether a more participatory process drawing on the expertise of Church scholars throughout the world might not have produced a different document. He also objects to some of the arguments prohibiting the use of reproductive technologies to treat infertility: "If experience is our guide, medical interventions to overcome sterility are precisely manifestations of the love between husband and wife."

The Church's instruction is likely the first rather than the last word in what promises to be a long and extensive debate. Whatever the judgments individuals make about its conclusions, there can be little question that the issues go to the heart of what it means to be human. These technologies place on our horizon unprecedented human control over our own genetic futures, our social and kinship patterns, and our relationships with



our siblings and our offspring. Most will agree that it is prudent to look, and to look hard, before we embrace them all without question.

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